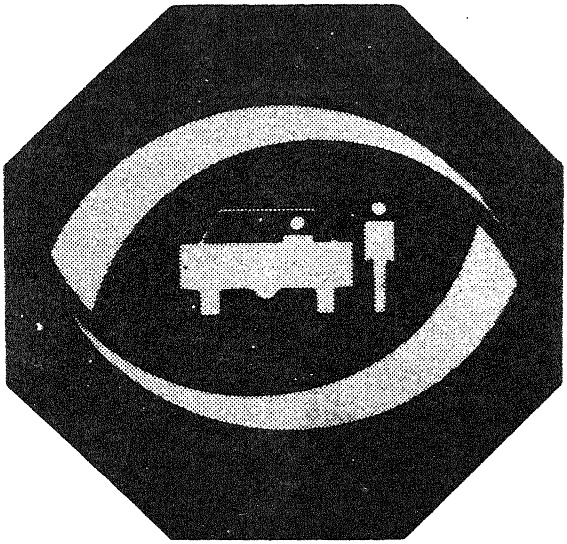
Highway Safety Literature

. . . A Bi-Monthly Abstract Journal

HSL No. 72-23 December 1, 1972 HS-011 854 - HS-011 915, HS-600 775; 859, HS-800 580; 659; 675; 677; 687; 691; 699; 700; 717; 724, HS-810 229; 230; 232; 233; 235, HS-820 213

HSL No. 72-23
December 1, 1972



**SPECIAL ANNOUNCEMENT
ON PAGE 21**

THIS ISSUE CONTAINS

HS-011 854 - HS-011 878;
HS-011 880 - HS-011 915
HS-600 775; 859,
HS-800 580; 659; 675; 677;
687; 691; 699; 700;
717; 724,
HS-810 229; 230; 232; 233;
235,
HS-820 213

U.S. Department of Transportation / National Highway Traffic Safety Administration

[redacted]

HIGHWAY SAFETY LITERATURE

... A Bi-Monthly Abstract Journal

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INTRODUCTION

Publications such as journal articles, proceedings, and research reports announced in *Highway Safety Literature* include some of the most recent additions to the collection of the NHTSA Scientific & Technical Information Service. Subject areas covered include all phases of highway, motor vehicle, and traffic safety, especially those encompassed by the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act of 1966.

Individual issues of *HSL* are numbered according to the year and the issue number within that year; thus, 72 designates the year and 1, 2, 3, etc. the individual issues. To aid the user in locating citations by the HS-number, the cover bears the inclusive entry number for each issue.

Entries in *HSL* are arranged according to the NHTSA Subject Category List shown in the Table of Contents. The list is a two-level arrangement consisting of five major subject fields subdivided into 59 subject groups. Documents related directly to the National Highway Traffic Safety Administration (NHTSA) are announced in a separate section headed NHTSA DOCUMENTS and are numbered in five distinct series: NHTSA Accident Investigation Reports (HS-600 000 series). NHTSA Compliance Test Reports (HS-610 000 series), NHTSA Contractors Reports (HS-800 000 series), NHTSA Staff Speeches, Papers, etc. (HS-810 000 series), and NHTSA Imprints (HS-820 000 series). For NHTSA DOCUMENTS in series HS-600 000 and HS-610 000, individual full case reports are available for inspection at the National Highway Traffic Safety Administration. HS-800 000 series and HS-820 000 series are available for, purchase from NTIS or GPO (see page ii). Although announced together in a separate section, these documents are also assigned specific subject categories for machine retrieval.

A document which contains a number of separate articles is announced as a complete volume in the subject category most applicable to it as a whole. Entries for the individual articles appear in their most specific subject category.

SAMPLE ENTRIES

Subject Category Array	
NHTSA Accession no	HS-800 218 Fld. 5/21; 5/9
Title of document	AN INVESTIGATION OF USED CAR SAFETY STANDARDS--SAFETY INDEX: FINAL REPORT. VOL. 6 - APPENDICES G-L
Personal author(s)	by E. N. Wells; J. P. Fitzmaurice; C. E. Guilliams; S. R. Kalin; P. D. Williams
Corporate author	Operations Research, Inc.
Collation	
Publication date	1969 150p Contract FH-11-6921 Report no. ORI-TR-553-Vol-6; PB-190 523
Abstract	Appendices G-L to this study of used car safety standards include: indenture model diagrams for classes I-IV motor trucks; degradation, wear, and failure data for motor truck classes I-IV; and safety index tables for classes I-IV motor trucks. Search terms; Wear; Trucks; Failures; Used cars; Inspection standards

AVAILABILITY: NTIS

HS-004 497 Fld. 5/19

AUTO THEFT–THE PROBLEM AND THE CHALLENGE

by Thomas A. Williams, Sr.

Journal citation .... Published in *FBI Law Enforcement Bulletin* v37 n12 p15-7 (Dec 1968)

Gives figures on the extent of the auto theft problem and comments on anti-theft devices available now or in the planning stage.

Search terms: Theft; Theft protection; Stolen cars

(Note: If the date of a report or Journal article is not given, the small letters nd will appear)

TABLE OF CONTENTS

NOTE: ( ) Numbers in parentheses following certain subject groups indicate the Highway Safety Program Standards (No. 1, and up) and/or Federal Motor Vehicle Safety Standards (No. 101 and up) which may apply to these groups.

INTRODUCTION AND
SAMPLE ENTRIES .... Inside Front Cover
AVAILABILITY OF DOCUMENTS ii

NHTSA SUBJECT FIELDS AND GROUPS

1/0 ACCIDENTS 1
- /1 Emergency Services (11, 15-16)
- /2 Injuries
- /3 Investigation (10, 14-15)
- /4 Locations (9, 14)
- /5 Statistical data

2/0 HIGHWAY SAFETY 4
- /1 Breakaway Structures
- /2 Communications
- /3 Debris Hazard Control and Cleanup (15-16)
- /4 Design and Construction (12, 14)
- /5 Lighting (14)
- /6 Maintenance (12)
- /7 Meteorological Conditions
- /8 Police Traffic Services (15)
- /9 Traffic Control (13-14)
- /10 Traffic Courts (7)
- /11 Traffic Records (10)

3/0 HUMAN FACTORS 7
- /1 Alcohol (8, 14)
- /2 Anthropomorphic Data
- /3 Cyclists
- /4 Driver Behavior
- /5 Driver Education (4, 14)
- /6 Driver Licensing (5, 10, 14)
- /7 Drugs Other Than Alcohol
- /8 Environmental Effects
- /9 Impaired Drivers
- /10 Passengers
- /11 Pedestrians (14-15)
- /12 Vision

4/0 OTHER SAFETY-RELATED AREAS 9
- /1 Codes and Laws (6)
- /2 Community Support (17)
- /3 Cost Effectiveness
- /4 Governmental Aspects
- /5 Information Technology
- /6 Insurance
- /7 Mathematical Sciences
- /8 Transportation Systems

5/0 VEHICLE SAFETY 10

* All Federal Motor Vehicle Safety Standards apply to passenger vehicles. An asterisk before a subject group indicates additional types of vehicles to which the indicated standards may apply.

- /1 Brake Systems (102, 105-6, 116)
- */2 Buses, School Buses, and Multipurpose Passenger Vehicles (102-4, 106-8, 111-3, 116, 205-6, 209, 211)
- */3 Cycles (3; 108, 112, 116, 205)
- /4 Design (14; 101-2, 105, 107, 201)
- /5 Door Systems (201, 206)
- /6 Fuel Systems (101, 301)
- /7 Glazing Materials (205)
- /8 Hood Latch Systems (113)
- /9 Inspection (1)
- /10 Lighting Systems (101, 105, 108, 112)
- /11 Maintenance and Repairs
- /12 Manufacturers, Distributors, and Dealers
- /13 Mirrors and Mountings (107, 111)
- /14 Occupant Protection (15; 201-4, 207-10)
- /15 Propulsion Systems
- /16 Registration (2, 10)
- /17 Safety Defect Control
- /18 Steering Control System (101, 107, 203-4)
- /19 Theft Protection (114-5)
- */20 Trucks and Trailers (102-4, 107-8, 112-3, 116, 205-6, 209)
- /21 Used Vehicles
- /22 Wheel Systems (109-10, 211)
- /23 Windshield-Related Systems (101, 103-4, 107, 205, 212)

NHTSA DOCUMENTS 16

NOTE: Material published in Highway Safety Literature (HSL) is intended for the information and assistance of the motor vehicle and highway safety community. While brand names, equipment model names and identification, and companies may be mentioned from time to time, this data is included as an information service. Inclusion of this information in the HSL should not, under any circumstances, be construed as an endorsement or an approval of any particular product, course, or equipment by the U.S. Department of Transportation, National Highway Traffic Safety Administration.

AVAILABILITY OF DOCUMENTS
AND
INSTRUCTIONS FOR ORDERING

Articles and reports whose citations and abstracts appear in HSL are acquired from many sources, such as periodicals, journals, NHTSA Contractors' reports and NHTSA staff speeches, and other reports. Those reports other than NHTSA Contractors' reports and NHTSA generated reports and speeches (see introduction) are assigned a lower consecutive accession (HS-) number.

Department of Transportation personnel may borrow copies of publications announced in HSL from the NHTSA Technical Reference Division. Non-DOT Personnel, in the Washington, D.C. area, may borrow copies of publications for a 24-hour period only. Telephone (202) 426-2768. Government personnel in the Washington, D.C. area, use government ID phone 118-62768.

The names of the journals cited in HSL appear in *italic type* preceded by the words "Published in." The journal containing the article cited may be borrowed from most research and public libraries. Non-DOT personnel outside the Washington area should contact their company or agency libraries for assistance.

(Use any of the most recent *periodical directories* for location and price of publications cited in HSL)

NHTSA Contractors' reports and other reports can usually be obtained as indicated under AVAILABILITY. However, there is no certainty that copies will be available for more than a limited period after a report is issued.

The more common availability sources are identified by symbols which are explained in the next column:

NTIS: National Technical Information Service, Springfield, Va. 22151. Order by accession number: HS, AD, or PB. Prepayment is required by NTIS coupon, check or money order (made payable to NTIS). GPO coupons are not acceptable. Documents are available in paper copy (PC); in full size original or reduced facsimile, and on microfiche (MF) a 4x6" negative sheet of film (reader required).

GPO: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Give corporate author, title, personal author, and report number. Prepayment is required by GPO coupon (NTIS coupons are not acceptable), check or money order (made payable to the Superintendent of Documents).

HRB: Highway Research Board, National Academy of Sciences, 2101 Constitution Ave., N. W., Washington, D. C. 20418.

NHTSA: National Highway Traffic Safety Administration, General Services Division, Washington, D.C. 20591 (Telephone (202) 426-0874), Give HS-No.

SAE: Society of Automotive Engineers, Dept. HSL, 2 Pennsylvania Plaza, New York, N.Y. 10001. Order by SAE report numbers. Prices given are list; discounts are available to SAE members and sometimes to libraries and U.S. Government Agencies. Prepayment is required; orders received without payment are subject to a $1 handling charge.

IMPORTANT NOTICE

WHEN REQUESTING a document, to be absolutely sure you receive what you order, give the accession number (HS, PB, AD number) or report number (in cases such as an SAE document), title of report, and the personal or corporate author (whichever is cited). When requesting an HS-numbered document from NTIS, add DOT/to the prefix HS-; example HS-800 000 should be ordered as DOT/HS-800 000.

1/0 ACCIDENTS

1/1 Emergency Services

HS-011 854 Fld. 1/1

EQUIPMENT FOR USE AT ROADSIDE ACCIDENTS

by P. Aston

Published in *British Medical Journal* v4 p214-7 (25 Oct 1969)

As road traffic increases and the hospital treatment of casualties becomes more centralized, the role of the general practitioner in the roadside care of accidents will assume greater importance. It is therefore essential that he is equipped with the basic items of equipment to deal with such a situation, even if it is only rarely that he is called to a road accident. A listing and a brief description of emergency medical equipment are given.

Search terms: Emergency medical services; Physicians; First aid equipment; First aid; Medical treatment

HS-011 855 Fld. 1/1

MEDICAL ORGANIZATION

by K. C. Easton

Published in *British Medical Journal* v4 p150-1 (18 Oct 1969)

7refs

An all-embracing emergency system, coordinating the efforts of police, physicians, ambulance drivers, firemen, and hospitals, to provide the best possible emergency care to traffic accident injured, is proposed.

Search terms: Emergency medical services; Physicians; First aid; Police cooperation with other agencies; Great Britain

HS-011 856 Fld. 1/1

TREATMENT OF SOFT TISSUE INJURIES AT THE ROADSIDE

by P. S. London

Published in *British Medical Journal* v4 p284-6 (1 Nov 1969)

1ref

A brief guide to the first aid treatment of traffic accident soft tissue injuries is presented. The management' of injuries of the soft tissues may be summarized: apply a dressing; stop accessible bleeding; and try to mitigate the effects of bleeding or burning. A list of equipment for first aid kits is given.

Search terms: Physicians; First aid equipment; First aid; Injuries; Medical treatment

HS-011 857 Fld. 1/1

EXTRICATION OF TRAPPED CASUALTIES

by R. Snook

Published in *British Medical Journal* v4 p478-80 (22 Nov 1969)

One of the most demanding situations the rescue services have to face is that of the seriously injured casualty who has become trapped in a smashed-up vehicle. It can make difficult demands on the doctor unless he knows a little of the procedures of the rescue services, and any doctor is greatly helped if the ambulance staff is familiar with the medical equipment being used. An emergency equipment vehicle is described, a modified four-wheel drive Landrover. It has a built-in generator for powering a wide range of electrical tools and three powerful floodlights. It also carries a wide range of portable hydraulic apparatus as well as ordinary hand tools and oxyacetylene cutting equipment; the vehicle itself is fitted with a power winch. Drums of cable allow the equipment to be operated at distances of more than 100 yards (91 meters) from the vehicle with ease.

Search terms: Physicians; Occupant rescue; Emergency medical services; Metal cutting; Emergency vehicles; Fire prevention; Emergency equipment

HS-011 858 Fld. 1/1; 4/3; 4/7

AN ANALYSIS OF FREEWAY EMERGENCY SERVICE SYSTEMS

by H. Keller

California Univ., Berkeley

1969 170p 145refs
Grant NSF-GK-1684
Report no. ORC-69-20; AD-695 378

Dissertation.

The operation of an emergency service system has been represented in an activity model. It describes the chronological sequence of events and activities performed by the major components: police, mechanical, fire, and medical service of the detection and service subsystems. The activity model has been applied to analyze selected detection and service systems on a linear urban freeway with high average daily traffic flows. Deterministic and stochastic models were developed for the major activities: detection, travel to the scene of incident, on-site service, and return travel to normal position. The activity model then was used as a basis for a next event simulation process. A cost and effectiveness study was employed to test the operation of the selected emergency service systems on a set of historical incident data. The general approach and the analytical procedures developed in this study permit an analysis of the effects of changes in various parameters relevant in emergency service systems.

Search terms: Driver aid systems; Benefit cost analysis; Systems analysis;

1/1 Emergency Services (Cont'd.)

HS-011 858 (Cont'd.)

Highway communication; Emergency reporting systems; Emergency road services; Police traffic services; Emergency medical services; Fire fighting; Accident survivability; Simulation models; Flow charts; Accident risk forecasting; Accident survival time; Communication systems; Mathematical analysis; Queueing models; Freeways; Accident location; Patrolling; Variance analysis; Accident surveillance; Travel time; Accident rates

AVAILABILITY: NTIS

1/2 Injuries

HS-011 859 Fld. 1/2

EXTREMITY INJURIES PRODUCED IN MOTOR VEHICLE COLLISIONS

by D.F. Huelke

Published in *Journal of Trauma* v10 n3 p189-200 (1970)

7refs
Grant PHS-AC-00107

Supported in part by USPHS, National Center for Urban and Industrial Health and the Automobile Manufacturers Assoc. through the Univ. of Michigan Hwy. Safety Res. Inst.

There are no accurate data on the number, frequency, or extent of extremity injuries related to motor vehicle accidents today because today's vehicles have a variety of safety features that have lessened the injury rate. Injuries to pedestrians are discussed and case histories of injuries to car occupants are presented. Specific injuries caused by vehicle interior impact areas are noted.

Search terms: Injuries by accident type; Leg injuries; Knee injuries; Arm injuries; Injury case reports; Injury causes; Pedestrian injuries; Head on collisions; Side impact collisions; Door caused injuries; Instrument panel caused injuries; Motorcycle accidents; Fractures

HS-011 860 Fld. 1/2; 5/17

FATAL UNINTENTIONAL CARBON MONOXIDE POISONING IN MOTOR VEHICLES

by S.P. Baker; R.S. Fisher; W.C. Masemore; I.M. Sopher

1972 16p 17refs
Contract FH-11-7399

Preprint to be published in *American Journal of Public Health*, Oct 1972. Supported by Insurance Institute for Highway Safety, Maryland Medical-Legal Foundation, and National Hwy. Traf. Safety Admin.

An investigation was undertaken to determine how many persons die in motor vehicles as the result of unintentional carbon monoxide poisoning, and to develop suggestions for potentially effective countermeasures. Sixty-eight such deaths were found to have occurred in Maryland during 1966-71. Fifty-one of the deaths were associated with faulty vehicles, usually due to rust. As a group these vehicles were significantly older than the population of registered vehicles. Three vehicles came from states with periodic vehicle inspection. Most deaths involved stationary vehicles, with the engine running to provide warmth. Three drivers were overcome by fumes while their cars were in motion. Carbon monoxide poisoning was not suspected initially in 14% of cases where the deceased was alone in the car. Suggested countermeasures include modifications to future cars, detection and correction of defects in existing vehicles, and prompt oxygen therapy for victims who are found alive.

Search terms: Carbon monoxide poisoning; Defective vehicles; Accident investigation; Carboxyhemoglobin; Asphyxia; Fatality causes; Blood alcohol levels; Vehicle age; Corrosion; Exhaust system failures; Vehicle inspection; Maryland; Synergism; Defect correction; Resuscitation; Accidents by vehicle age

1/3 Investigations

HS-011 861 Fld. 1/3

AN ACCIDENT-BASED ANALYSIS OF ROAD-USER ERRORS

by A.B. Clayton

Published in *Journal of Safety Research* v4 n2 p69-74 (Jun 1972)

16refs

Sponsored by the Science Res. Council, London.

An interdisciplinary team conducted an investigation of road-user errors as part of an at-scene study of road accidents. Data obtained from on-site investigations and follow-up interviews were used to develop a tentative classification of road-user errors. Two errors accounted for over half the known errors committed: these were failure to look (28.5%) and excessive speed with regard to the conditions (25.3%). Basic differences were found in the causal factors associated with the various types of errors. Some implications of the results are discussed.

Search terms: Accident causes; Accident analysis; Accident research; Accident investigation; Multidisciplinary teams; Driver error caused accidents; Field of view; High speed caused accidents; Driver performance under stress; Panic; Age factor in accidents; Driver experience; Driver mileage; Sex factor in accidents; Attention lapses; Variance analysis; Worcestershire (England); Hazard perception; Driver confusion

HS-011 862 Fld. 1/3; 1/5; 1/4

FATAL TRAIN-VEHICLE COLLISIONS IN MICHIGAN

by J.A. Green

Published in *HIT Lab Reports* p1-4 (Apr 1972)

2refs

Data from the Michigan fatal accident file provided the basis for a study of some basic features of 366 fatal railroad-vehicle (R-V) accidents, and the HSRI computer plotting program was used to generate a map indicating the geographical distribution of R-V fatality occurrence in Michigan for the seven-year period, Jan. 1964-Dec. 1970. Several factors emerged which appear to distinguish this class of fatal accidents from the class of overall fatal automobile accidents. Two-thirds of the fatal R-V accidents occur during the daytime (notably during peak traffic periods), whereas more than one-half of the overall fatal automobile accidents occur during nighttime. In addition, 52.5% of the fatal R-V accidents involved failure to observe a traffic control device, a violation that was involved in only 8.2% of the overall fatal accidents.

Search terms: Michigan; Vehicle train collisions; Warning system effectiveness; Accident studies; Accident statistics; Accident factors; Drinking drivers; Traffic law violations; Time of accidents; Male drivers; Driver error caused accidents; Female drivers; Accident location; Accident analysis; Driver characteristics; Warning signals; Maps; Railroad grade crossing accidents; Day vs night accidents; Month

HS-011 863 Fld. 1/3; 3/4

ACCIDENTS—RHYTHMIC THREAT TO FEMALES

by Liskey, N.E.

Published in *Accident Analysis and Prevention* v4 n1 p1-11

19refs

A study to determine whether traffic accidents of females have any relationship to the menstrual cycle was conducted. Accident data of high school and college age women were analyzed. On the basis of this study and the analysis of obtained data, the following conclusions have been drawn: high school females and college women not using the birth control pill tend to have more accidents during the menstrual and premenstrual phases of their cycles; high school females and college women not using birth control pill, with menstrual flows of 6 days or more, encounter fewer accidents during their premenstrual and menstrual phases of their complete cycle than their counterparts who have menstrual flows of four or less days; there is no significant difference between the accident involvement of high school females and the accident involvement of college and university females not using the birth control pill.

Search terms: Female drivers; Menstruation; High school drivers; Accident rates; Chi square test; Oral contraceptives; Young adult drivers; Accident factors; Lunar rhythm; Accident risks

1/5 Statistical data

HS-011 864 Fld. 1/5; 1/3

CHARACTERISTICS OF RURAL AND URBAN FATAL ACCIDENTS ON THE INTERSTATE HIGHWAY SYSTEM, 1969-70

by H.R. Hosea; B.V. Chatfield

Published in *Public Roads* v37 n1 p22-8 (Jun 1972)

4refs

Accident patterns and accident factors (day and time of occurrence, pavement conditions, weather conditions, type of vehicle, driver age and sex, and driver sobriety) of rural and urban fatal accidents are discussed and tabulated. Emphasis is on rural-urban accident differences.

Search terms: Accident analysis; Accident statistics; Accident rates; Accident factors; Drinking drivers; Fatality rates; Accident causes; Interstate Highway System; Rural accidents; Urban accidents; Driver physical fitness; Single vehicle accidents; Time of accidents; Day of week; Accident types; Pavement condition; Weather caused accidents; Driver age; Driver sex; Light conditions

HS-011 865 Fld. 1/5; 1/3

CRASHES BETWEEN LARGE AND SMALL CARS: THE REAL-WORLD PERSPECTIVE. PT. 1. DIFFERENT CARS, DIFFERENT WORLDS?

by J.D. Epstein; J. O'Day

Published in *HIT Lab Reports* p5-12 (Apr 1972)

3refs

This paper examines the phenomenon of crashes between small cars and large cars from the perspective of actual occurrence. Specifically, it determines the frequency with which these types of crashes occur among the vehicle population. The principal data file used to facilitate the inquiry contains all reported crashes that occurred in Oakland County, Michigan during 1969. The frequency of crashes between large and small vehicles was found to be less than expected. Manufacturer, model, and weight data for vehicles included in small or large car categories are given in an appendix.

Search terms: Michigan; Vehicle vehicle collisions; Accidents by vehicle size; Accident risk forecasting; Head on collisions; Rear end collisions; Side impact collisions; Driver age; Accident

1/5 Statistical data (Cont'd.)

HS-011 865 (Cont'd.)

location; Time of day; Vehicle weight; Automobile models; Compact automobile accidents; Urban accidents; Rural accidents; Accident rates; Vehicle size

2/0 HIGHWAY SAFETY

HS-011 866 Fld. 2/0

THE TRAFFIC SAFETY STORY. A BLACK-AND-WHITE PAPER

by L. Brody

Published in *Journal of Traffic Safety Education* v18 n5 p7-9 (Oct 1971)

1ref

The author discusses improvements in traffic safety resulting from the Highway Safety Act of 1966. Aspects discussed are protection against the secondary collision, interpretation of a slight drop in the fatality rate, the role of drinking drivers, and driver education.

Search terms: Highway Safety Act of 1966; Drinking drivers; Driver education; Driver improvement; Accident responsibility; Fatality rates; Occupant protection; Secondary collisions

HS-011 867 Fld. 2/0; 2/9

ROAD SCHOOL (52ND) ANNUAL PROCEEDINGS, PURDUE UNIVERSITY, MARCH 28-31, 1966

by D.G. Shurig, comp. and ed.

Published as *Engineering Bulletin of Purdue University* v50 n4 (Jul 1966)

268p refs
Report no. Eng-Extension-Ser-123

Twenty-eight papers are presented concerning highway safety programs, police traffic supervision, traffic engineering, traffic courts, state and local safety programs, highway beautification, the Indiana Highway Needs Study, Indiana State Highway Commission research and training center, traffic control uniformity, planning for snow emergency, utility cuts, evaluating urban highway needs, effects of control device changes on intersection accidents, evaluation of need for median lane construction, traffic signal maintenance, and the Indiana Drainage Code.

Search terms: Benefit cost analysis; Indiana; Traffic engineering; Highway safety programs; Highway planning; Traffic control devices; Snow removal; Intersection collisions; Drainage; Highway maintenance; Traffic management; Traffic courts; Traffic flow; Highway beautification; Traffic signal maintenance; Police traffic services; County government; State government; Training facilities; Research facilities; Manual on Uniform Traffic Control Devices for Streets and Highways; Traffic control device uniformity; Utilities; Indianapolis; Urban highways; Median lanes; Traffic conflicts

2/2 Communications

HS-011 868 Fld. 2/2; 4/7

AN EVALUATION OF THE IMPACT RESPONSE OF VARIOUS MOTORIST-AID CALL SYSTEMS

by J.E. Martinez; D.E. Hairston

Published in *Highway Research Record* n386 p66-74 (1972)

5refs
Contract FH-11-7156

Sponsored by Highway Research Board Committee on Traffic Safety Barriers and Sign, Signal and Lighting Supports.

This paper presents the findings of analytical and experimental studies performed on the Maryland, Illinois, and Ohio call-box configurations. Two experimental tests were conducted for each: a pendulum test and a full-scale crash test. A parameter study was carried out with the aid of a mathematical model verified by the full-scale crash tests. The study employed vehicle weights varying from 2,000 to 5,000 lb. and impacting velocities ranging from 20 to 60 mph. The most significant findings of the study may be summarized as follows: the vehicle velocity and momentum changes due to the collision were considerably less than the established tolerable limits to 11 mph and 1,100 lb-sec; vehicle damage was minor; call box damage is usually severe, and the unit generally has to be completely replaced after a collision; and detachment of call-box assembly components during a collision may produce a hazardous condition.

Search terms: Impact tests; Maryland; Illinois; Ohio; Roadside telephones; Pendulum tests; Mathematical models; Vehicle fixed object collisions; Computerized simulation; Damage severity; Driver aid systems

2/4 Design and Construction

HS-011 869 Fld. 2/4

AN EVALUATION OF SAFETY AT HIGHWAY-RAILWAY GRADE CROSSINGS. FINAL REPORT

by T. Urbanik, 2nd

Joint Hwy. Res. Proj.

1971 168p 66refs
Report no. JHRP-11

Cover title: *Driver Information Systems for Highway-Railway Grade Crossings.*

An attitudinal survey was used to evaluate driver attitude concerning the hazard at railroad grade crossings, citizen appraisal of priorities for improving grade crossing safety, driver evaluation of possible warning systems for crossings, and the development of the general design of a proposed new advance warning system. The research indicates that the respondents considered railroad grade crossings more hazardous than several other highway hazards. However, all hazards were, at most, only considered moderately hazardous. The improvement of safety at railroad grade crossings was given high priority by the respondents. An overhead changeable message sign was the most preferred method of warning at railroad grade crossing. It was concluded that a field installation is desirable.

Search terms: Railroad grade crossings; Railroad grade crossing signals; Flashing warning signals; Accident prevention; Changeable message signs; Questionnaires; Opinion polls; Surveys; Driver attitude measurement; Hazards; Hazard perception; Highway taxation; Warning systems; Highway improvements; Priorities; Display systems; Overhead signs

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HS-011 870 Fld. 2/4

CRASH TESTS OF AN ARTICULATED ENERGY-ABSORBING GORE BARRIER EMPLOYING LIGHTWEIGHT CONCRETE CARTRIDGES

by G.W. Walker; B.O. Young; C.Y. Warner

Published in *Highway Research Record* n386 p19-27 (1972)

7refs

Sponsored by Highway Research Board Committee on Traffic Safety Barriers and Sign, Signal and Lighting Supports.

The concept of vermiculite concrete energy absorption has been further tested by incorporating cartridges into the Hi-Dro Cell sandwich unit designed for water-cell use. Repeated tests were performed with gradually increased use of the cartridges in place of water cells. Tests up to 55 mph with medium-weight automobiles indicate improved response, especially with regard to the approach to square-wave deceleration pulse. Harness-restrained drivers reported no discomfort in three separate impacts at speeds above 50 mph.

Search terms: Barrier design; Vermiculite; Barrier collision tests; Impact attenuators; Energy absorbing barriers; Impact velocity; Head on impact tests; High speed impact tests; Water cushions; Honeycomb structures; Cellular concrete; Pressure waves; Deceleration; Acceleration

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HS-011 871 Fld. 2/4

EVALUATION OF CRASH CUSHIONS CONSTRUCTED OF LIGHTWEIGHT CELLULAR CONCRETE

by D.L. Ivey; E. Buth; T.J. Hirsch; J.G. Viner

Published in *Highway Research Record* n386 p10-8 (1972)

5refs

Sponsored by Highway Research Board Committee on Traffic Safety Barriers and Sign, Signal and Lighting Supports.

Lightweight cellular concrete crash cushions have now progressed to the point that experimental installations are being made in the continental United States. This report describes the development of these safety devices and presents the results of the most recent vehicle crash tests. This crash cushion is composed of vermiculite concrete, lightweight welded wire fabric, and cylindrical cardboard forms. At the present stage of development, the crash cushion is an effective system that protects motorists from collisions with rigid obstacles whether they collide in a head-on or side-angle attitude.

Search terms: Cellular concrete; Honeycomb structures; Crash cushions; Energy absorbing barriers; Barrier collision tests; Head on impact tests; Vermiculite; Impact attenuators; Angle impact tests; Deceleration

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HS-011 872 Fld. 2/4

HYBRID BARRIER FOR USE AT BRIDGE PIERS IN MEDIANS (MODULAR CRASH CUSHION PLUS CONCRETE MEDIAN BARRIER)

by G.G. Hayes; D.L. Ivey; T.J. Hirsch; J.G. Viner

Published in *Highway Research Record* n386 p1-9 (1972)

9refs

Sponsored by Highway Research Board Committee on Traffic Safety Barriers and Sign, Signal and Lighting Supports.

A traffic safety barrier for use at bridge piers in roadway medians has been designed and crash-tested. The hybrid system consists of steel drum crash cushions that have smooth transitions to concrete median barriers. The crash cushions, which are located in front of the outermost bridge piers, act as energy absorbers for frontal impacts and as redirection barriers for angle impacts. The concrete median barrier serves as a redirection barrier for interior angle impacts. Two vehicles were directed into the side of the crash cushion at 10° and 20° to test the system in the crash cushion median barrier transition area. The vehicles were redirected smoothly and showed no spinout or overturning tendency. Without structural repairs to the barrier after the 10° test, a lightweight vehicle was directed head on into the crash cushion and was brought to a stop in an acceptable manner.

2/4 Design and Construction (Cont'd.)

HS-011 872 (Cont'd.)

Search terms: Crash cushions; Energy absorbing barriers; Median barriers; Angle impact tests; Barrier collision tests; Deceleration; Damage severity; Head on impact tests; Overpasses; Impact attenuators; Abutments

HS-011 873 Fld. 2/4

DYNAMIC TESTS OF AN ENERGY-ABSORBING BARRIER EMPLOYING SAND-FILLED PLASTIC BARRELS

by E.F. Nordlin; J.R. Stoker; R.N. Doty

Published in *Highway Research Record* n386 p28-51 (1972)

12refs

In cooperation with the Federal Hwy. Administration. Sponsored by Highway Research Board Committee on Traffic Safety Barriers and Sign, Signal and Lighting Supports.

The results of three full-scale tests of vehicles impacting energy-absorbing barriers employing sand-filled frangible plastic barrels are reported. The barriers were designed for placement in front of fixed objects located in freeway gores. They were composed of an array of 15 to 17 barrels 36 in. in diameter by 30 and 36 in. high. The barriers were 21 and 25 ft. long and tapered from a 9-ft. width at the rear to a 3-ft. width at the nose. The barrels were not attached to the ground. Sedans weighing approximately 4,700 lb impacted the nose of the barrier head on at a speed of approximately 60 mph and at a 15-deg. angle. A small sedan weighting about 1,900 lb also impacted the nose of the barrier head on at 59 mph. The barrier was judged acceptable in the areas of cost, ease of construction and maintenance, aesthetics, simplicity, and versatility and is recommended for use in operational trial installations.

Search terms: Energy absorbing barriers; Dynamic tests; Impact attenuators; Barrier collision tests; Barrier design; Damage severity; Deceleration; Angle impact tests; Debris; Impact severity; Sand; High speed impact tests; Vehicle weight; Instrumented vehicles; Barrels

2/9 Traffic Control

HS-011 874 Fld. 2/9

THE DETECTABILITY OF TWO SLOW VEHICLE WARNING DEVICES

by O. Asper

Published in *Journal of Safety Research* v4 n2 p85-9 (Jun 1972)

11refs

Supported by the Illinois Rural Safety Council.

This study compared the detectability of the SMV (slow moving vehicle) emblem and the red flag. The measured detection times were expressed in mean numbers of seconds from the rear of a farm wagon. Detectability of the SMV emblem and red flag were compared for selected demographic variables. Subjects detected the SMV emblem at a significantly greater distance than the red flag regardless of sex, age, or place of residence. The difference in mean detection times of the SMV emblem and red flag would allow motorists traveling at 50 mph approximately 270 feet of additional warning when approaching the rear of a farm vehicle displaying the SMV emblem.

Search terms: Slow moving vehicle signs; Warning signs; Driver sex; Driver age; Driver residence; Sign visibility; Variance analysis; Visual perception; Cinematographic simulation; Signal effectiveness; Sign effectiveness; Red warning triangles; Red warning flags

HS-011 875 Fld. 2/9; 2/4

PASSING PERFORMANCE MEASUREMENTS RELATED TO SIGHT DISTANCE DESIGN

by G.D. Weaver; J.C. Glennon

Texas A and M Univ. Texas Transp. Inst.

1971 95p 9refs
Report no. RR-134-6; PB-207 994

Sponsored by Texas Hwy. Dept. in cooperation with the Federal Hwy. Administration.

This report presents a proposed passing sight distance design concept to integrate design and striping based on the safety, operational, and legal aspects of the passing maneuver. Passing maneuvers under actual highway operating conditions were photographed and analyzed to determine operational characteristics during high-speed passing maneuvers. Minimum passing sight distances and desirable lengths of passing zones are recommended. New applications of the proposed design concept that considers both the required sight distance and zone length are discussed.

Search terms: Passing; Highway design speed; Sight distances; Design standards; Passing zone markings; Driver reaction distance; Highway design; Photography; No passing zones; Speed differential

AVAILABILITY: NTIS

HS-011 876 Fld. 2/9

A DETERMINATION FRAMEWORK FOR WET WEATHER SPEED LIMITS

by J.C. Glennon

Texas A and M Univ. Texas Transp. Inst.

1971 52p 9refs
Report no. RR-134-8F; PB-207 335

Sponsored by Texas Hwy. Dept in cooperation with Federal Hwy. Administration.

Determination charts, based on a composite of frictional requirements for passing, emergency stopping, and emergency path-correction maneuvers, are presented. Determination charts for highway curves are included.

Search terms: Speed limits; Wet road conditions; Tire pavement interface; Surface friction; Passing; Road curves; Pavement skid resistance; Tire skid resistance; Mathematical analysis; Lateral acceleration; High speed; Stopping distance; Sight distances; Speed studies; Coefficient of friction; Driver emergency responses; Wet skidding; Friction studies; Vehicle trajectories

AVAILABILITY: NTIS

HS-011 877 Fld. 2/9; 5/20

UNSAFE AT WHAT SPEED?

by B. Kovacik; O. Bates

Published in *Wheels Afield* v6 n7 p36-7, 40 (Jul 1972)

The establishment of maximum speed limits for recreational vehicles is discussed. A chart presenting the present maximum speed limits in all 50 states for trailers, campers, and mobile homes is included.

Search terms: Speed limits; Recreational vehicles; Travel trailers; Towing; Braking; Campers (truck mounted); Mobile homes

3/0 HUMAN FACTORS

3/1 Alcohol

HS-011 878 Fld. 3/1

THE EFFECTS OF ETHYL ALCOHOL ON REACTION TIME AND TIME ESTIMATION

by H.H. Galarneau; R.F. Krenek

Oklahoma Univ.

1971 14p 6refs

Presented at the fifteenth annual meeting of the Human Factors Society, New York, Oct 1971.

This paper presents the results of four experiments involving the effects of ethyl alcohol on human performance: simple reaction time, time period estimation (by production), and choice reaction time in two modes (spatial uncertainty in the stimulus and spatial uncertainty in the response). Information theory is utilized as a paradigm for quantifying the degree of difficulty in the choice-reaction time experiments. The results from six subjects indicate that: no conclusive change in simple response time occurs at the blood alcohol levels (BAL) tested (40 mg.% and 80 mg.%); significant increases in both motor movement time and detection-central processing time occur with increasing BAL in both stimulus and response uncertainty choice reaction time modes; this effect becomes more pronounced as the amount of information contained in the stimulus increases; and time appears to pass more slowly for most individuals as the BAL increases.

Search terms: Alcohol effects; Reaction time; Decision making; Information theory; Time perception; Blood alcohol levels; Motor skills; Visual perception; Placebos; Ethyl alcohol

HS-011 880 Fld. 3/1

TRAFFIC PERCEPTION UNDER THE INFLUENCE OF ALCOHOL

by W. Buikhuisen; R.W. Jongman

Published in *Quarterly Journal of Studies on Alcohol* v33 n3 p800-6 (Sep 1972)

11refs

While watching a film taken from a moving car, intoxicated subjects observed fewer important traffic incidents, missed more incidents to the sides rather than the center of the screen, more nonmoving objects, and more incidents that were part of a complex situation than sober subjects.

Search terms: Drinking drivers; Alcohol effect on vision; Attention; Television in testing; Hazard perception; Cinematographic simulation; Nystagmus; Peripheral vision; Driver performance; Visual behavior; Driver intoxication; Motion perception; Blood alcohol levels

HS-011 881 Fld. 3/1

DOES DRUNK DRIVING CALL FOR A TOUGH REMEDY?

by W.L. Roper

Published in *California Highway Patrolman* v36 n4 p4-5, 40-1, 46-7, 50-1 (Jun 1972)

Even if the American public can be taught to see drinking as a dangerous and self-destructive habit, there will still be a large number of rebellious drinkers who will continue to kill people on the highways. There seems to be a growing opinion favoring harsher treatment for the drinking driver. Some of these measures are discussed including bills before the California Legislature that would send drunk drivers to jail, deny them insurance protection, and provide for pre-sentence investigations to determine if they have prior records. One bill is designed to stigmatize a drunk driver by having a large D displayed on his car and stamped on his driver's license.

Search terms: Drinking drivers; Alcoholism; Alcohol usage deterrents; Alcohol laws; California; Driver rehabilitation; Alcohol education; Penalties

3/1 Alcohol (Cont'd.)

HS-011 882 Fld. 3/1; 1/3

RACE AND SOCIAL STATUS DISCRIMINATION AND POLICE ACTION IN ALCOHOL AFFECTED COLLISIONS

by R. Zylman

Published in *Journal of Safety Research* v4 n2 p75-84 (Jun 1972)

18refs

The question of whether there is racial discrimination in drinking-driving law enforcement practices is discussed. The frequencies of collision involvement and DWI arrests for whites and nonwhites are compared relative to their proportions in the population-at-risk. Data from the Grand Rapids Study, which included information on 9,353 collision-involved drivers and 8,008 control drivers, are used. Analysis of that data showed that: nonwhite drivers were involved in proportionately more collisions than whites, nonwhites were overrepresented among drivers with high blood alcohol levels (BAC), and drivers of lower social class were overrepresented in the high BAC and collision groups regardless of race. There was no racial discrimination in the enforcement of drinking-driving laws. Of those who were legally intoxicated, 49% of the nonwhites and 51% of the whites were arrested.

> Search terms: Drinking drivers; Arrests; Racial discrimination; Ethnic groups; Driver social class; Traffic law enforcement; Blood alcohol levels; Racial factors; Grand Rapids; Alcohol education; Accident rates; Accident factors

HS-011 883 Fld. 3/1; 4/7

THE LOGNORMAL DISTRIBUTION OF BLOOD ALCOHOL CONCENTRATIONS IN DRIVERS

by A. Ekholm

Published in *Quarterly Journal of Studies on Alcohol* v33 n2 p508-12 (Jun 1972)

5refs

It has recently been concluded that if the blood alcohol concentration in drivers is lognormally distributed, the proportion of drivers with blood alcohol concentrations above a certain level does not depend on the mean of the population. This conclusion is shown to be wrong, and approximate formulas for evaluating the change in the proportion from changes in the mean and standard deviation of the population are given.

> Search terms: Blood alcohol levels; Logarithms; Mathematical analysis; Drinking drivers

3/4 Driver Behavior

HS-011 884 Fld. 3/4

BETTER DRIVING

Anonymous

Published in *Autocar* v136 n3970 p17-24 (18 May 1972)

Hints are presented on proper performance in using traffic lanes, maneuvering in traffic circles, signaling intelligently, joining traffic streams, queueing, driving in fog, and fast driving and overtaking.

> Search terms: Driver performance; Driver skills; Traffic lanes; Signal usage; Driver to driver communications; Merging; Queueing; Overtaking; Fog driving; Driving tasks; Lane changing; Passing; Cornering

3/5 Driver Education

HS-011 885 Fld. 3/5

RECOMMENDED SPECIFICATIONS FOR ONE MOBILE CLASSROOM HOUSING A SIXTEEN TO TWENTY (16-20) UNIT DRIVING SIMULATION SYSTEM

by E.H. Darland

San Jose State Coll.

n.d. 25p

> Cover title: *Selecting the Appropriate Driving Simulation System for Your Needs.*

Recommended specifications are presented to assist decision makers in selecting the driving simulation system that will be of maximum value to driver educators in educating students to become competent drivers. Hardware as well as the improvement of film programs are discussed. The recommended specifications are standards for comparison since no simulation system meets the specifications.

> Search terms: Classroom driver instruction; Driving simulation; Specifications; Trailers

3/6 Driver Licensing

HS-011 886 Fld. 3/6; 4/5

WASTED SAFETY GOLDMINE

by B. Gordon

Published in *Fleet Owner* p54-7 (Feb 1972)

The National Driver Register (NDR) is a data retrieval system maintained by NHTSA, which contains records of individuals whose licenses have been denied, terminated, or withdrawn. Presently, information from the register is available only to driver licensing authorities. Such information would be invaluable to fleet operators; to a police officer developing an accident investigation report; to a district attorney trying to determine whether to file first or second offense charges; to a traffic judge trying to determine an appropriate sentence; to school administrators to assist in the selection of driver education teachers; and to insurance companies to help identify poor insurance risks. Expanding the usage of the NDR would require changing the law.

Search terms: National Driver Register; Driver licensing; Computerized driver records; Driver license revocation; Driver license suspension; Problem drivers; Driver license cancellation; Federal laws

3/12 Vision

HS-011 887 Fld. 3/12

EFFECT OF LOW LEVELS OF CARBON MONOXIDE ON VISUAL PROCESSES

by S.M. Luria; C.L. McKay

Naval Submarine Medical Center

[1971] 13p 15refs

Four subjects breathed compressed air containing 200 ppm carbon monoxide for 45, 90, and 180 minutes, and a wide variety of visual processes were tested. Changes occurred in scotopic sensitivity, reaction time, and perhaps the evoked cortical responses which indicated a decrement in performance after 90 minutes of exposure but followed by improvement after 180 minutes of exposure.

Search terms: Carbon monoxide poisoning; Test volunteers; Vision tests; Night vision; Eye movements; Reaction time; Visual degradation; Visual threshold

HS-011 888 Fld. 3/12

EQUIPMENT FOR DETERMINING THE TIME TAKEN TO READ A SPEEDOMETER

by J.S. Armour

Transport and Road Res. Lab. (England)

1972 15p 1ref
Report no. TRRL-LR-450

An apparatus has been designed which measures accurately the time a driver's forward vision is interrupted when he reads his speedometer. Using an existing optical head-up display projector, a two digit number is displayed on a partially silvered glass plate mounted on the vehicle's windshield. Simultaneously this number is indicated by the pointer of a meter which replaces the conventional speedometer. On observing the first head-up displayed number the driver has the task of comparing this number with that shown on the dashboard mounted meter; then, returning to his forward line of vision he declares whether or not the number he now sees has changed from that first observed. By alteration of the change-over period of the head-up displayed numbers the total time the driver's forward vision is interrupted can be determined. Further possible applications of this apparatus are indicated.

Search terms: Headup displays; Visual perception; Reading rate; Driving task analysis; Speedometers; Driver reaction time; Character recognition

4/0 OTHER SAFETY-RELATED AREAS

4/8 Transportation Systems

HS-011 889 Fld. 4/8

COMPARATIVE EVALUATION OF NEW TRANSPORTATION TECHNOLOGY. VOL. 1

TRW Systems Group

1971 163p 33refs
Report no. PB-209 481

Sponsored by Michigan Bureau of Transp.

The objectives of the report were to identify and define the characteristics of a limited number of transportation systems, innovative in concept and implementable in the near term, which exhibit potential advantages over conventional rail rapid transit; and to identify, detail, and weigh those technological improvements, with their cost and time factors, that will be necessary to bring each of these selected systems into a revenue service status. A review of 96 innovative transportation systems resulted in the identification of 11 candidate systems. These proprietary systems appear to embody that technology with the best potential for meeting the near term as well as future requirements of the State of Michigan, as identified in this study. A detailed evaluation of the candidate transportation systems and estimated cost-time factors of technological improvements recommended for each system are presented. Relevant social and environmental impacts of transit systems are discussed.

Search terms: Transportation systems; Transportation system costs; Guideway systems; Transportation studies; Environmental factors; Vehicle air pollution; Vehicle operating costs; Consumer acceptance; Michigan; Tube transportation; Monorails; Demand responsive transportation systems; Air cushion vehicles; Travel time; Propulsion systems; Transportation system capacities; Aerial transit systems; Transportation noise; Transportation planning; Urban transportation; Terminals; Rapid transit systems; Public transportation

AVAILABILITY: NTIS

HS-011 890 Fld. 4/8

COMPARATIVE EVALUATION OF NEW TRANSPORTATION TECHNOLOGY. VOL. 2, APPENDICES

TRW Systems Group

1971 151p 53refs
Report no. PB-209 482

4/8 Transportation Systems (Cont'd.)

HS-011 890 (Cont'd.)

Sponsored by Michigan Bureau of Transp.

For abstract and search terms see HS-011 889

AVAILABILITY: NTIS

5/0 VEHICLE SAFETY

5/2 Buses, School Buses, and Multipurpose Passenger Vehicles

HS-011 891 Fld. 5/2; 5/4

THE OTHER BUSING ISSUE: SAFETY

by B. Kaapcke

Published in *Journal of Insurance* v33 n5 p17-22 (Sep-Oct 1972)

On the basis of miles driven, school buses have a low accident rate. But the accidents that do happen reveal many unnecessary hazards arising from mechanical failures, flimsy construction, and poor design. A new Department of Transportation standard, which each state must implement as quickly as possible, is intended to improve school bus safety by setting requirements for proper and safe equipment, maintenance of equipment, and the selection, training and supervision of drivers. This standard deals mainly with school bus operation. Bills introduced into the House of Representatives during the current session would require DOT to issue standards covering crashworthiness of body and frame, interior protection, emergency exits, and a number of other items; require DOT to build an experimental prototype safety school bus; and require testing of all school buses by the manufacturer before sale.

Search terms: School bus safety; School bus design; School bus accidents; School bus drivers; School bus standards; Child safety

5/4 Design

HS-011 892 Fld. 5/4

THE WISHART SPLIT CYCLE ENGINE

by J.D. Wishart

Published in *Journal of Automotive Engineering* v2 p3-6 (Sep 1971)

The split cycle engine gets its name because the four acts necessary to all internal combustion engines, and previously performed in one cylinder, are split up into logically separated pairs. Suction and compression, cold acts, are performed in a separate multi-stage air compressor; while firing and exhaust, hot acts, are performed in half the number of firing cylinders required by a four stroke engine. The compressor keeps the air cool while it is being compressed, and combustion in the firing cylinders takes place on the cooler constant pressure system. These combine to create low temperatures at all points of the cycle. Detonation is therefore eliminated and nitrogen oxide minimized.

Search terms: Engine design; Internal combustion engines; Compressors; Cylinders; Combustion; Split cycle engines

HS-011 893 Fld. 5/4

THE NEW ESVs: RACE TO BUILD THE WORLD'S SAFEST CAR

by J.P. Norbye; J. Dunne

Published in *Popular Science* v200 n6 p54-7 (Jun 1972)

The experimental safety vehicle program is discussed. The Department of Transportation's performance-capability requirements, while they are not to be read as a proposal for future standards, constitute goals devised with the aim of establishing limits of feasibility.

Search terms: Safety cars; Crashworthiness; Experimental vehicles; Safety design; Accident survivability; Passive restraint systems; Occupant protection; Crashworthy bodies; Vehicle weight

5/6 Fuel Systems

HS-011 894 Fld. 5/6

COMBUSTION AND EMISSION PROPERTIES OF ROTARY ENGINES

by K. Yamamoto; T. Muroki; T. Kobayakawa

Published in *SAE Journal of Automotive Engineering* v80 n7 p26-9 (Jul 1972)

Based on SAE-720357, *Combustion Characteristics of Rotary Engines*

An analysis of the knock characteristics and octane requirements of rotary combustion engines, and details on how air/fuel ratio, ignition timing, and combustion chamber shape affect emissions are given. Toyo Kogyo's air injection reactor (AIR) system is briefly discussed.

Search terms: Rotary engines; Knock; Combustion chamber design; Octane requirements; Exhaust emissions; Air fuel ratio; Carbon monoxide; Hydrocarbons; Nitrogen oxides; Ignition timing; Air injection reactor systems; Exhaust emission control devices; Thermal reactors; Engine operating conditions

HS-011 895 Fld. 5/6

AN ALTERNATIVE APPROACH TO AUTO EMISSION CONTROL

by R.B. Mancke

Published in *California Management Review* v14 n4 p82-6 (Summer 1972)

This paper studies the costs of two possible policies for controlling a major source of air pollution—automobile emissions. It concludes that the costs of reducing automobile pollutants by enforcing Congress' mandatory emission standards are both higher and less equitably allocated than the costs of an alternative policy: a direct tax on motor vehicle emissions.

Search terms: Smog taxes; Air pollution control costs; Emission standards; Exhaust emissions measurement; Evaporative emission measurement; Exhaust emission control devices; Clean Air Act of 1970

HS-011 896 Fld. 5/6; 5/9

LARGE-SCALE MONITORING OF AUTOMOBILE EXHAUST PARTICULATES; METHODS AND COSTS

by L.S. Birks; J.V. Gilfrich; D.J. Nagel

Naval Res. Lab.

1971 26p 10refs
Report no. NRL-MR-2350; AD-738 801

The hypothetical problem addressed is annual monitoring of 150 million cars for exhaust particulates. This would have to be done at inspection stations located throughout the states and would require simple, fool-proof equipment for collecting samples and interpreting results. Four types of information about particulate emission are of concern: total mass of particulates in gram/mile; particle size distribution; elemental composition of the constituents; and state of chemical combination. Various instrumental methods for such a large-scale analysis effort are described and estimated costs are given. None of the costs listed include establishment of inspection stations which would have to be done on a nationwide basis but presumably would be used for inspection of brakes, lights, tires, gaseous emissions, etc. Thus it would seem unrealistic to add these costs to the monitoring of exhaust particulates.

Search terms: Air pollution control costs; Exhaust emissions measurement; Particle size analysis; X ray spectrometers; Spectroscopic analysis; Air pollution monitoring; Exhaust emission tests; Exhaust emissions sampling; Particulate air pollutants; Inspection costs; Inspection stations; Exhaust composition; Neutron activation analysis; Plasmas (physics); Fluorescence

AVAILABILITY: NTIS

5/14 Occupant Protection

HS-011 897 Fld. 5/14

PASSENGER CAR OCCUPANT RESTRAINT ALTERNATIVES. DEMONSTRATION AND DISPLAY: A CONSUMER RESEARCH STUDY

by R.S. Baxter

Chrysler Corp.

1972 13p
Report no. SAE-720430

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

Using interviews and questionnaires, a survey was made in Kansas City, Mo. to obtain consumer reactions to and preferences for various occupant restraints based upon perceptions of performance, convenience, and overall usefulness. Specific cost factors were excluded. Two of the restraint alternatives were a cushion system and semi-automatic or continuous belt arrangement. The research was designed to determine whether or not further development was warranted. Preferences shifted to 82% for seat belts, 5% for air bags, and 11% for extra, crushable panels after the filmed performance demonstrations. Final preferences following the vehicle inspections were similar, with a slight shift toward extra, crushable panels and away from air bags. Among the 83% preferring seat belts, better than four-out-of-five wanted both lap and shoulder belts. A minority of 22% preferred the continuous lap belts over the self-locking retractor lap belts.

Search terms: Seat belts; Air bag restraint systems; Shoulder harnesses; Cushioning; Instrument panel padding; Interviews; Opinion polls; Consumer preferences; Consumer demand forecasting; Three point restraint systems; Restraint system usage; Questionnaires; Kansas City (Mo.); Automatic seat belts; Consumer acceptance

AVAILABILITY: SAE

HS-011 898 Fld. 5/14

A CONSUMER VIEWPOINT ON CAR RESTRAINT SYSTEMS

by L.R. Barnes

Automobile Club of Michigan

1972 22p
Report no. SAE-720429

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

Lap-shoulder belts became standard with very little, very inneffective explanation of why they should be used. National effort is needed to persuade all to use them, and auto industry to improve them, and see the effect of buzzers and interlocks before mandating airbags or equivalent. This paper looks at the past history of restraints, forecasts the future if airbags are to be mandated without explaining them. AAA of Michigan motorist survey shows a strong dislike of airbags, a preference for seatbelt-shoulder harness if a choice must be made, a strong feeling that it is not the

5/14 Occupant Protection (Cont'd.)

HS-011 898 (Cont'd.)

business of government to mandate airbag or seatbelt use. The question is raised about claims of the number of lives that airbags will save. Are they too high?

Search terms: Michigan; Seat belts; Shoulder harnesses; Air bag restraint systems; Opinion polls; Consumer preferences; Federal control; Questionnaires; Head restraint usage; Consumer dissatisfaction; Restraint system effectiveness; Restraint system usage; Consumer acceptance; Safety device costs; Seat belt standards; Vehicle safety standards; Audio warning devices

AVAILABILITY: SAE

HS-011 899 Fld. 5/14

THE BIOMECHANICAL DEVELOPMENT OF INJURY-ATTENUATING MOTOR VEHICLE DESIGN

by L.M. Patrick

Published in *Journal of Trauma* v10 n3 p220-31 (1970)

67refs

From an engineering standpoint the problem of protecting the occupant of a vehicle consists of defining the crash environment in quantitative physical terms, determining the human tolerance to the crash environment, and providing safety devices. The biomechanics of human tolerance and the mechanics of impact are discussed. Safety design is discussed in terms of passenger compartments integrity, restraint systems, padding, energy-absorbing steering columns, and air cushions.

Search terms: Occupant protection; Human body impact tolerances; Biomechanics; Impact attenuators; Air bag restraint systems; Energy absorbing steering columns; Impact protection; Injury research; Impact forces; Human acceleration tolerances; Acceleration protection; Injury prevention; Deceleration; Crashworthy bodies; Safety design; Energy absorbing systems; Seat belts; Shoulder harnesses; Occupant vehicle interface

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HS-011 900 Fld. 5/14

ENERGY MANAGEMENT IN IORS

by W.R. Carey; T.J. Wissing; R.G. Gehrig; G.W. Goetz; D.A. Larson

Eaton Corp.

1972 16p 2refs
Report no. SAE-720418

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

Inflatable Occupant Restraint Systems (IORS) are categorized according to high, medium, and low momentum air bag deployment energies. Theoretical flow curves for these categories are presented which minimize deployment accelerations imparted to out of position occupants, in particular the standing child. Practical techniques to achieve these flow curves for stored gas, augmented gas, and solid inflators are presented. Aspirating systems are described and their superiority over direct fill systems is indicated.

Search terms: Air bag restraint systems; Air bag inflation devices; Gas generators; Air bag deployment forces; Augmented gas inflation devices; Propellant actuated devices; Aspirator inflation devices; Pyrotechnic igniters; Stored gas inflation devices

AVAILABILITY: SAE

HS-011 901 Fld. 5/14

THE ANATOMY OF AN INFLATOR FOR AIR CUSHION OCCUPANT SYSTEMS

by R.C. Lawwill

Olin Corp.

1972 13p
Report no. SAE-720416

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

Many anxieties have been generated concerning the introduction of an air cushion passive restraint system in automobiles for a variety of reasons; but, one of the most prevalent anxieties stems from the common lack of understanding relative to the functioning characteristics and safety of the inflator which is to contain some quantity of pyrotechnic material – this inflator becoming a permanent fixture in the passenger compartment of the vehicle. This presentation discusses in understandable detail the physical and functional characteristics of the basic pyrotechnically augmented inflator and how each of its major components contribute to form a controllable system which can be varied to meet various systems demands. It further discusses a proposed marriage of inflator and sensor in a system totally restricted from functioning by any other mode than the properly prescribed crash energy signature

Search terms: Carbon monoxide; Nitrogen dioxide; Nitric oxide; Toxicity; Propellant actuated devices; Air bag inflation devices; Sensors; Actuators; Noise

AVAILABILITY: SAE

HS-011 902 Fld. 5/14

CRASH SENSOR BASIC REQUIREMENTS

by T.O. Jones; O.T. McCarter; P. Recupito; G.H. Anguil

General Motors Corp.

1972 23p 9refs
Report no. SAE-720419

Includes appendix: *General Motors Crash Sensor System.* Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

The primary purpose of this paper is to suggest basic crash sensor requirements which will form the basis of discussion for the Crash Sensor Session of the 2nd International Conference on Passive Restraints. No attempt has been made in the body of this paper to suggest a particular crash sensor scheme or to recommend specific detectors or devices. However, an Appendix is provided in which is described the current General Motors sensor scheme. As air cushion systems are developed and evaluated, it becomes more apparent that the crash sensor is, perhaps, the most vital system component. In view of the criticality of this system component, a suggested comparative analysis of crash sensors has been included.

Search terms: Sensors; Air bag restraint systems; Reliability; Air bag inflation time; Head on impact tests; Detectors; Evaluation

AVAILABILITY: SAE

HS-011 903 Fld. 5/14

COMPACT, ALL-SOLID GAS GENERATORS

by G.A. Lane; T.E. Dergazarian; G.R. Staudacher

Dow Chemical Co.

1972 7p 9refs
Report no. SAE-720417

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

Gas generators for filling auto air cushions have been developed in several compact sizes and configurations. All-solid chemical-generating compositions have been developed to give nearly pure nitrogen gas. Other compositions developed give mainly carbon dioxide. Gas cushions ranging in size from 1-12 ft^3 have been inflated. Deployment time, bag temperature, and sound level are within safe limits. Toxicity tests have been performed on dogs without harmful effects being observed.

Search terms: Gas generators; Nitrogen; Carbon dioxide; Animal experiments; Toxicity; Propellant actuated devices; Air bag inflation devices

AVAILABILITY: SAE

HS-011 904 Fld. 5/14

GAS GENERATOR AND ASPIRATOR FOR AUTOMATIC OCCUPANT RESTRAINT SYSTEMS

by F. McCullough, Jr.; W.F. Thorn; B.L. Katter; E.W. Schmidt

Rocket Res. Corp.

1972 18p 14refs
Report no. SAE-720413

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

Development of reliable, low-cost inflators without toxic exhaust products is the key to successful inflatable occupant restraint systems. The characteristics and performance of gas generators and aspirator inflators are presented together with cushion gas characteristics. Toxicity considerations, including both gaseous and aerosol constituents, are discussed. Results indicate that inflators can be produced that will meet stringent, yet realistic, toxicity requirements. The feasibility of the aspirator inflator has been established, and this unique device offers distinct and significant advantages over conventional direct inflation devices.

Search terms: Gas generators; Toxicity; Anoxia; Propellant actuated devices; Aspirator inflation devices; Air bag inflation devices

AVAILABILITY: SAE

HS-011 905 Fld. 5/14

FRENCH DEVELOPMENTS IN ORIGINAL DEPLOYABLE SYSTEMS (WITH REFERENCE TO SAFETY BELTS)

by C. Tarriere; G. Mauron; P. Ventre

Renault-Peugeot Assoc.

1972 37p 14refs
Report no. SAE-720410

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

The Association PEUGEOT-RENAULT has explored several paths, technological as well as theoretical, regarding deployable methods of restraint. The first work was carried out using various kinds of American-made devices. At the same time, the Association PEUGEOT-RENAULT is actively participating in the development of French devices. This communication explains the present stage of these technological solutions, analyzes the performances obtained, and allows comparison of the latter with those obtained using seat belts.

Search terms: France; Air bag restraint systems; Air bag inflation devices; Gas generators; Performance characteristics; Renaults; Dummies; Head impact areas; Foreign automobiles; Noise tolerances; Pyrotechnic igniters; Restraint system tests; Toxicity; Seat belt tests; Air bag deployment forces; Passive restraint systems; Steering wheel design

AVAILABILITY: SAE

HS-011 906 Fld. 5/14

SPECIAL PROBLEMS AND CONSIDERATIONS IN THE DEVELOPMENT OF AIR CUSHION RESTRAINT SYSTEMS

by E.H. Klove, Jr.; R.N. Oglesby

General Motors Corp.

1972 9p
Report no. SAE-720411

Presented at 2nd International Conference on Passive Restraints, Detroit, 22-25 May 1972.

The General Motors air cushion restraint system and specific technical problems of systems development and implementing a production build program are discussed. The details of the system include a description of the components of the driver's and front passenger's systems, crash sensing, and variable inflation. The discussion of specific technical problems includes performance considerations, such as occupant rebound, child-size occupants, out-of-position occupants, non-barrier type crashes, and the function of the appearance cover. Also included is a discussion of the toxicity potential, noise risk, sensor development, reliability considerations, and field service requirements.

Search terms: Air bag restraint systems; Human body size; Child restraint systems; Occupant positioning; Toxicity; Noise tolerances; Sensors; Restraint system tests; Rebound; Air bag inflation devices

AVAILABILITY: SAE

HS-011 907 Fld. 5/14

NEW DEVICES TO PROTECT THE KIDDIES

by E. Janicki

Published in *California Highway Patrolman* v36 n4 p14-5, 24-5, 27 (Jun 1972)

The need for adequate child restraint systems is discussed. A checklist of important safety features includes the following: the child seat must be designed so it can be fastened in place with the vehicle seat belts; the seat must give protection from front and rear-end crashes; the seat should withstand frontal forces up to 1,000 pounds for 10 seconds; forward movement of the seat occupant should be restricted to 12 inches, under 1,000 pound load; the seat must give adequate protection against whiplash injury; the seat's restraint belts must be at least 1 1/2 inches wide; the child's upper body should be restrained by belts or impact pad; special padding should line all areas the child's head might contact; there must be no sharp or pointed hardware.

Search terms: Infant restraint systems; Restraint system design; Injury prevention; Child safety seats; Child restraint systems; Vehicle safety standards

5/8 Steering Control Systems

HS-011 908 Fld. 5/18

GENERAL MOTORS ENERGY-ABSORBING STEERING COLUMN AS A COMPONENT OF SHIPBOARD PERSONNEL PROTECTION

by J.T. Hawkins; A.E. Hirsch

Published in *Shock and Vibration Bulletin* n37 pt4 p79-84 (Jan 1968)

5refs

Sponsored and funded by NAVSEC and NAVSHIP under SF-0150404 Task-1917.

Pedestals composed of integral numbers of the collapsible section of GM energy absorbing steering columns have force-limiting capabilities which meet protection requirements of personnel subjected to ship shock motions from underwater explosion attack. The high stroke-thickness ratio of this device permits its effective application for protection in low head-room areas. In this respect it is the most efficient device yet investigated.

Search terms: General Motors Corp.; Energy absorbing steering columns; Ships; Human acceleration tolerances; Shock (mechanics); Injury prevention; Impact protection; Underwater explosions

5/22 Wheel Systems

HS-011 909 Fld. 5/22

WIRE ADHESION TESTING

by L.C. Coates; C. Lauer

Published in *Rubber Chemistry and Technology* v45 n1 p16-25 (Mar 1972)

3refs

Presented at a meeting of the Div. of Rubber Chemistry, American Chemical Society, Cleveland, 12-15 Oct 1971.

Interest in radial tires with steel cords attracts the development of compounds with superior rubber to metal adhesion. Theorists have concluded that no test that breaks adhesive bonds is actually measuring adhesion, as all are affected by the physical properties of the bonded materials and the geometry of the test samples. This is why a better method of measuring the adhesion of rubber to wire was developed: a test method that for all practical purposes is insensitive to compound physical properties and dimensions of the test sample.

Search terms: Steel wire; Rubber; Adhesion; Laboratory tests; Bonding; Tire cord tests; Stress analysis; Failure stress; Tire materials

HS-011 910 Fld. 5/22

DESIGN GUIDE TO ALL-GLASS RADIALS

by F. Lachut

Published in *Rubber World* v166 n2 p29-32, 61 (May 1972)

The super tire of the future may be a one carcass ply, belted radial—in this case a 1 plus 2 all-glass reinforced tire. In this radial design, a single-ply fiberglass reinforced carcass is covered by two fiberglass belts similar to those used in today's bias belted tires. Laboratory and road tests show that this type of tire has equal or better treadwear rates, allows for excellent vehicle handling characteristics, offers a softer, more comfortable ride, and passes the accelerated wheel tests specified in DOT Regulation 109. Further, the all glass tires offer substantial cost savings.

> Search terms: Tire cords; Fiberglass; Radial tires; Tire ply number; Tire tests; Tire wear resistance; Tire riding characteristics; Road tests; Tire performance; Tire standards; Tire characteristics; Glass belted tires

HS-011 911 Fld. 5/22

VISCOELASTIC PROPERTIES OF TRUCK TIRE COMPOUNDS AND THE RELATED HEAT BUILD-UP

by P. Kainradl; G. Kaufmann

Published in *Rubber Chemistry and Technology* v45 n1 p1-9 (Mar 1972)

6refs

> Presented at a meeting of the Div. of Rubber Chemistry, American Chemical Society, Cleveland, 12-15 Oct 1971.

Rubber compounds used in the manufacture of tread-cap, tread-base, and for the rubber-coating of the rayon cord for 12.00-20 tires were varied in composition and, in consequence, their viscoelastic properties were altered. Operating temperatures, in test-wheel runs, were measured in the shoulder region of the tire close to the casing, using a needle-thermocouple. Statistics show that the greater contribution to the heat build-up comes from the tread-base. Operating temperatures of tires to be expected as a result of the compound variations can be estimated in advance.

> Search terms: Truck tires; Viscoelasticity; Tire materials; Tire temperature tests; Thermocouples; Rubber compounds; Regression analysis; Tire treads; Operating temperature

HS-011 912 Fld. 5/22

WHY WORN TIRES ARE DANGEROUS

by J. Dunne

Published in *Modern Tire Dealer* v54 n2 p122, 124, 126 (Sep 1972)

> At head of title: Black Lake Testing Ground Proves . . .

The dangers of driving with smooth tires are discussed. The particular danger of bald tires and the hydroplaning phenomenon on wet pavement are described. The stability hazards of driving with mixed smooth and new tires is mentioned. Stopping distances of new and worn tires on wet pavements are compared.

> Search terms: Tire wear; Tire traction; Wet skidding; Hydroplaning; Wet road conditions; Stopping distance; Vehicle stability; Vehicle control; Pavement skidding characteristics

HS-011 913 Fld. 5/22

THE CONDITION OF TYRES IN USE ON CARS, 1969/70

by R.W. Lowne

Transport and Road Res. Lab. (England)

1972 28p 1ref
Report no. TRRL-LR-449

Two surveys have been made of the conditions of tires in use on cars and the following conclusions drawn: about 9% of cars have at least one tire with a tread depth below the legal limit of 1 mm; there are few cars with illegal combinations of radial and crossply tires; there appear to be few cars with tires exhibiting gross damage or structural failure; inflation pressure errors exceeding 8 p.s.i. in one or more tires are to be found on about 13% of cars; and differential errors of the same amount are to be found on about 17% of cars. There is ample evidence that tread depths of less than 1 mm can lead to serious braking and steering difficulties under some wet road conditions. The effects on safety of inflation pressure errors of 8 p.s.i. or more are less well understood.

> Search terms: Surveys; Tire inspection; Tire regulations; Tire inflation pressure; Crossply tires; Radial tires; England; Tire tread depths; Tire pairing

HS-011 914 Fld. 5/22

TIRES, THE TREADFUL FACTS

by J. Matthews

Published in *Wheels Afield* v6 n7 p49-53, 88 (Jul 1972)

Tips are given for replacing tires on recreational vehicles, including truck campers, van campers, motor homes, and trailers. Tire care tips are also given. Accompanying charts show passenger car and station wagon tire load limits and tire sizes. Tire load ratings for high-flotation truck tires, conventional truck tires, and trailer tires are also presented.

> Search terms: Recreational vehicles; Tire load limits; Tire sizes; Tire inflation pressure; Station wagons;

5/22 Wheel Systems (Cont'd.)

HS-011 914 (Cont'd.)

Campers (truck mounted); Mobile homes; Travel trailers; Tire ply number; Truck tires; Flotation tires; Tire maintenance; Tire characteristics; Tire treads; Trailer tires

HS-011 915 Fld. 5/22

ON-CAR TIRE GRINDER FOR IMPROVED RIDE SMOOTHNESS

by R.J. Caulfield; R.J. Higgins

General Motors Corp.

1972 6p 2refs
Report no. SAE-720465

Presented at National Automobile Engineering Meeting, Detroit, 22-26 May 1972.

Smooth road shake complaints resulting from tire and wheel nonuniformities have been greatly reduced on original equipment tires. However, the problem still exists on after-market tires that have not been ground. The On-Car Tire Grinder (OCG) was developed by General Motors Research to provide a means for correcting smooth road shake complaints in the field. The device effectively duplicates the grinding done on original equipment tires. It has a low initial cost, does not require removing the tire from the car, and has proved practical for service use. Several companies have been given a free license to manufacture the On-Car Grinder for sale to tire stores and automobile dealers.

Search terms: Tire grinding; Tire force measurement; Tire tread depths; Tire riding characteristics; Tire vibration; Tire truing machines; Tire maintenance

AVAILABILITY: SAE

NHTSA DOCUMENTS

NHTSA Accident Investigation Reports

HS-600 775 Fld. 1/5; 1/3

MULTIDISCIPLINARY ACCIDENT INVESTIGATION SUMMARIES. VOL. 3, NO. 1

National Hwy. Traf. Safety Administration

1972 261p

This report contains case summaries of recent in-depth reports submitted by NHTSA sponsored multidisciplinary accident investigation teams in a continuing series of publications. These case reports are individual, clinical studies of accidents generally involving vehicles of the last three model years of fatal, injury producing, or property damage severity (severe enough so that at least one vehicle must be towed from the scene). The teams investigate each accident in-depth concerning themselves with each element of the collision (human, vehicle, environment) as it interacts with each phase of the collision (pre-crash, crash, post-crash). Each of the summaries contained in this report consists of identification information, basic information on the highway and vehicles involved, a description of the drivers and occupants involved (with their injuries), a phase-by-phase description of the sequence of events of the collision, and a list of the causal factors, conclusions and recommendations. Finally, as an aid, a diagram of each collision is represented.

Search terms: Multidisciplinary teams; Accident case reports; Accident analysis; Fatalities; Injury case reports; Damage severity; Accident causes; Accident location; Accident scale drawings; Accident reconstruction; Precrash phase; Crash phase; Accident types; Postcrash phase; Environmental factors; Injury severity; Accident investigation; Accident severity; Human factors; Injury factors; Injury causes; Accident studies; Accident factors; Time of accidents

AVAILABILITY: NTIS

HS-600 859 Fld. 1/5; 1/3

MULTIDISCIPLINARY ACCIDENT INVESTIGATION SUMMARIES. VOL. 3, NO. 3

National Hwy. Traf. Safety Administration

1972 283p

This report contains case summaries of recent in-depth reports submitted by NHTSA sponsored multidisciplinary accident investigation teams in a continuing series of publications. These case reports are individual, clinical studies of accidents generally involving vehicles of the last three model years of fatal, injury producing, or property damage severity (severe enough so that at least one vehicle must be towed from the scene). The teams investigate each accident in-depth concerning themselves with each element of the collision (human, vehicle, environment) as it interacts with each phase of the collision (pre-crash, crash, post-crash). Each of the summaries contained in this report consists of identification information, basic information on the highway and vehicles involved, a description of the drivers and occupants involved (with their injuries), a phase-by-phase description of the sequence of events of the collision, and a list of the causal factors, conclusions and recommendations. Finally, as an aid, a diagram of each collision is represented.

Search terms: Multidisciplinary teams; Accident case reports; Accident analysis; Fatalities; Injury case reports; Damage severity; Accident causes; Accident types; Accident scale drawings; Accident reconstruction; Precrash phase; Crash phase; Postcrash phase; Environmental factors; Injury severity; Time of accidents; Accident investigation; Accident severity; Human factors; Accident location; Injury causes; Injury factors; Accident studies; Accident factors

AVAILABILITY: NTIS

NHTSA Contractors Reports

HS-800 580 Fld. 3/7; 3/1

DRUG USE AND HIGHWAY SAFETY: A REVIEW OF THE LITERATURE. FINAL REPORT

by J.L. Nichols

Wisconsin State Univ., Stevens Point

1971 122p 92refs
Contract DOT-HS-012-1-019

Topics covered include the effects of drugs, types of drug users; research problems in assessing risk; laboratory findings concerning the effects of drugs; survey findings, toxicological investigations; and a discussion of the legal aspects of drug-driving laws. A review of the research literature failed to confirm suggestions that drug use, other than alcohol, is causing a large percentage of highway crashes. Further, no investigation, of any type, has demonstrated a disproportionate contribution to crashes or violations by drug use per se.

Search terms: Reviews; Drugs; Drug effects; Drug caused accidents; Hypnotics; Sedatives; Tranquilizers; Stimulants; Marijuana; Hallucinogens; Narcotics; Alcohol effects; Drinking drivers; High risk drivers; State laws; Uniform Vehicle Code; Drug addiction; Driver performance; Federal laws; Laboratory tests; Accident investigation; Driver personality; Amphetamines; Alcohol usage; Barbiturates; Accident studies; Driver records; Blood alcohol levels; Driver skills; Synergism; Accident risk forecasting; Problem drivers

AVAILABILITY: GPO $1.25

HS-800 659 Fld. 5/4

EXPERIMENTAL SAFETY VEHICLE (PHASE TWO) DEVELOPED BY GENERAL MOTORS. FINAL REPORT

General Motors Corp.

1972 117p
Contract DOT-OS-00095
Report no. A-2853

Rept. for 25 Jun 1970-30 Jun 1972.

This document is an illustrated description of the ESV system designed and developed by General Motors. Body structures designed to crush in a controlled manner for efficiently managing the forces of 50 mph barrier crashes are described in detail. Chassis features designed to meet the accident avoidance requirements of the contract are reviewed in more general terms. Rationales for significant design elements are provided along with information on General Motors design philosophy in the ESV program. An occupant protection system that includes a fully passive padding system for 20 mph front barrier impacts and air cushions for higher speed impacts is explained. Other features, including an aluminum body, elimination of windshield side pillars, and a body structure to control vehicle crash motion, are described.

Search terms: Experimental vehicles; Safety cars; Chassis design; Body design; Energy absorbing systems; Crashworthiness; Occupant protection; Front structures; Rear structures; Vehicle weight; Interior design; Crashworthy bodies; Safety design; Impact tests; Frame design; Restraint system design; Energy absorbing materials; Padding; Air bag restraint systems

AVAILABILITY: NTIS

HS-800 675 Fld. 5/22

APPLICATION STUDY OF ULTRASONIC NONDESTRUCTIVE INSPECTION FOR TIRE COMPLIANCE TESTING. FINAL REPORT

by R.N. Pierce

Southwest Res. Inst.

1971 155p
Contract FH-11-7280
Report no. SwRI-STRUC-2638

The intent of the study was to ascertain if correlations existed between areas containing acoustic structural anomalies (detected prior to dynamic testing) and the subsequent test-wheel performance of a tire or tire group, and to investigate effect of wheel tests in creating new, acoustic anomalies, or altering those detected during ultrasonic inspections performed prior to dynamic testing. Of the 174 tires ultrasonically inspected, 87 tires indicated the presence of definitive, subsurface ASA (acoustic structural anomalies). During the dynamic testing, 14 of the 87 tires failed. From the total of 158 wheel tested tires that passed the S109 high-speed or endurance tests, 136 tires were subsequently ultrasonically inspected. Of these, 116 tires indicated the presence of ASA; the remaining 20 were classified as being devoid of any ASA.

Search terms: Tire test equipment; Tire tests; Ultrasonic tests; Tire defects; Nondestructive tests; Dynamic structural analysis; Acoustic measurement; Bias belted tires; Radial tires; Tire materials; Tire noise; Tire failures; Bias tires; Dynamic tests; Durability tests; Tubeless tires; Tire characteristics; Compliance tests

AVAILABILITY: NTIS

HS-800 677 Fld. 5/14

ELECTRONIC CRASH RECORDER: DESIGN AND PRELIMINARY DEVELOPMENT. VOL. 1. – FINAL REPORT

by C.M. Conlon, Jr.

NHTSA Contractors Reports (Cont'd.)

HS-800 677 (Cont'd.)

AVCO Corp.

1972 166p
Contract FH-11-7603

The requirements for a sensing and recording device for use in passenger vehicles are listed with a discussion of how the requirements are met with a prototype unit which was fabricated and assembled. A complete description of the electronic circuits for conditioning signals from remote transducers is included with a signal processing technique for recording data on a magnetic tape system. Laboratory tests on critical elements of the recording devices are discussed and the results of the tests are noted to show feasibility of the design.

Search terms: Crash phase; Precrash phase; Recorders; Sensors; Magnetic tapes; Transducers; Pulse code modulation; Accelerometers; Potentiometers; Acceleration detection; Braking recorders; Speed recorders; Shock (mechanics); Laboratory tests; Postcrash phase; Flow charts; Temperature endurance tests; Vibration response

AVAILABILITY: NTIS

HS-800 687 Fld. 5/4

BASIC RESEARCH IN CRASHWORTHINESS. 2. TESTING AND EVALUATION OF COLLAPSING FORWARD STRUCTURE MODIFICATION CONCEPT IN CAR-TO-CAR FRONTAL COLLISIONS. INTERIM TECHNICAL REPORT

Cornell Aeronautical Lab., Inc.

1972 145p 4refs
Contract FH-11-7622
Report no. CAL-YB-2987-V-4

In an attempt to enhance the collision response of vehicles undergoing car-to-car frontal impacts, regions of the frame structure in front of the engine and fire wall were modified on a typical, full size front engine automobile (1968 Ford sedan). The collision responses examined included the longitudinal (impact direction) passenger compartment decelerations, the front end vehicle crush distance, and the amount of penetration (fire wall intrusion) into the passenger compartment. A car-to-car collision between two fully modified vehicles produced less than satisfactory results due to override in each vehicle. Despite the large fire wall intrusions, the overall performance of the modified cars in this test appeared to be better than that of two unmodified cars in a similar car-to-car crash.

Search terms: Vehicle vehicle collisions; Vehicle vehicle impact tests; Crashworthy bodies; Energy absorbing front structures; Deceleration; Bumpers; Bumper design; Fire walls; Dummies; Acceleration; Passenger compartments; Torque boxes; Crush distance; Head on impact tests; Frame design; Front engine automobiles; Penetration tests; Underride override collisions; Collapse; Automobile modification; Impact angle; Instrumented vehicles

AVAILABILITY: NTIS

HS-800 691 Fld. 4/1

RULES OF THE ROAD RATED

by E.F. Kearney

National Com. on Uniform Traf. Laws and Ordinances

Published as *Traffic Laws Commentary* v1 n3 (Aug 1972)

31p 5refs
Contract DOT-HS-107-1-153

This commentary shows how state traffic laws compare with the Rules of the Road chapter of the Uniform Vehicle Code as revised in November of 1971. It attempts to provide a more precise picture of the status of state traffic laws that will facilitate rapid identification of particular areas of a state's laws that may not be in substantial conformity with the code, indicate areas of the statutory law where uniformity may be markedly poor on a nationwide basis, and identify states whose traffic laws may need substantial attention on a priority basis as part of contemporary efforts to improve highway safety. Tables are presented rating each state's uniformity with the code.

Search terms: Uniform Vehicle Code; Traffic laws; State laws; Traffic law uniformity

AVAILABILITY: GPO $0.40

HS-800 699 Fld. 3/1; 4/7

DRINKING DRIVER AND TRAFFIC SAFETY PROJECT. FINAL REPORT. VOL. 1

by O.R. Didenko; A.W. McEachern; R.M. Berger; S. Pollack

University of Southern California

1972 97p 14refs
Contract FH-11-7099

On the basis of analyses of over 4,000 cases, a simplified prediction model was developed which improves the discrimination between drinking drivers and non-drinking drivers by approximately 10%. A similar level of improvement was achieved for recidivist drunk-drivers compared with one-time drunk-drivers. In addition an experimental evaluation of the effects of different intervention methods, which included AA, an Alcoholic Rehabilitation Center, films and lectures, and different forms of group therapy, compared with a control group which were given conventional treatment, was carried out. The results were inconclusive, but suggested that for a short one-year follow-up period, there is little difference between the conventional and the experimental treatment methods, or among different experimental treatment methods. An extended followup, now under way, may invalidate this negative conclusion.

Search terms: Drinking drivers; Mathematical models; Driver rehabilitation; High risk drivers; Low risk drivers; Forecasting; Driver counseling; Group dynamics; Discussion groups; Traffic law violations; Accident rates; Accident repeater drivers; Driver educational levels; Psychotherapy; Driver age; Alcohol usage deterrents; Arrests; Factor analysis; Driver fatalities; Driver criminal history; Driver characteristics; Questionnaires; Probability theory; Problem drivers

AVAILABILITY: NTIS

HS-800 700 Fld. 3/1; 4/7

DRINKING DRIVER AND TRAFFIC SAFETY PROJECT. FINAL REPORT, VOL. 2. PROBABILITIES FOR DRINKING DRIVERS

by A.W. McEachern

University of Southern California

1972 117p
Contract FH-11-7099

This volume includes a brief description of a prediction model developed from over 4,000 cases, including drinking drivers, recidivist drinking drivers, and driver license applicants who had never been convicted of drunk driving. Tables of probabilities of being a drunk driver (as opposed to not being a drunk driver) and of being a recidivist drunk driver (as opposed to a one-time drunk driver) are presented. The five variables used in the prediction model are: education, total number of minor traffic violations, age, number of accidents, and total number of non-traffic arrests. The probabilities associated with all possible combinations of characteristics on these five variables are presented, along with a brief description of how they might be used as aids to administrative or judicial decisions.

Search terms: Drinking drivers; Probability theory; Driver age; Arrests; Traffic law violations; Driver educational levels; Accident repeater drivers; Driver criminal history; Driver characteristics; High risk drivers; Problem drivers; Variables; Statistical analysis

AVAILABILITY: NTIS

HS-800 717 Fld. 5/14

SAFETY BELT INSTRUCTIONAL BOOKLET

by B.E. Haughey; P.A. Alter; H.H. Shettel

American Institutes for Res.

1972 27p
Contract FH-11-7522

This programmed instructional text for children beings with a pre-program attitude survey, presents questions on safety belts, describes types of safety belts and how to use them, and safety devices for children, and concludes with a post-program attitude survey.

Search terms: Instruction manuals; Programmed instruction; Safety belts; Seat belts; Three point restraint systems; Shoulder harnesses; Child restraint systems; Child safety education; Child safety seats

AVAILABILITY: GPO $0.20

HS-800 724 Fld. 4/5

A FORTRAN PROGRAM FOR VEHICLE SIDE IMPACT. USER'S GUIDE

by P. Spencer; J. Taylor

National Hwy. Traf. Safety Administration; Control Systems Res., Inc.

1972 109p 2refs
Contract DOT-HS-018-1-101-12
Report no. 325-121-01

A computer program is presented in FORTRAN language to simulate a vehicle-to-vehicle side impact situation. A complete listing of the program is given along with descriptions of the program logic, sample input, printer output, and automatic graphic output. The simulation incorporates 28 individual parameters associated with vehicle geometry, initial conditions, and other variables relative to structural characteristics and a point-mass occupant situated inside the struck vehicle.

Search terms: Computer programs; Computerized simulation; Vehicle vehicle collisions; Side impact collisions; Accident simulation; Fortran; Parameters; Lateral intrusion; Stiffness; Punched cards; Flow charts; Simulation models; Mathematical models; Impact forces; Impact angle; Impact velocity; Deflection; Time factors

AVAILABILITY: NTIS

NHTSA Staff Speeches, Papers, etc.

HS-810 229 Fld. 3/5; 3/1

RESEARCH INTO PROGRAMS OF EDUCATION, REHABILITATION AND DRIVER BEHAVIOR

by R.B. Voas

National Hwy. Traf. Safety Administration

1972 59p 77refs

Presented at the Conference on Medical, Human and Related Factors Causing Traffic Accidents, Including Alcohol and Other Drugs, Montreal, 30 May 1972.

The primary method of reducing the human contribution to accident causation must be through improved training

NHTSA Staff Speeches, Papers, etc. (Cont'd.)

HS-810 229 (Cont'd.)

of the vehicle operator. Four major categories of driver education are described. Driver education is the initial education of the driver which provides the skills to get him on the road. Public education, a second type of educational process, involves the presentation of messages over mass media. These messages are directed at individuals who are already operating vehicles and generally are intended to modify their attitudes toward driving. Driver improvement involves training or attempts at attitude modification of a limited number of individuals selected from the overall population, usually because of specific problem behavior. Some drivers are believed to be dangerous because they are sick. This is particularly true of problem drinkers who operate vehicles. For these individuals, court based treatment programs are being established.

Search terms: Driver education; Public information programs; Driver improvement schools; Driver rehabilitation; Driver behavior; Accident factors; High school driving courses; Driver education evaluation; Safety campaigns; Drinking drivers; Alcohol Safety Action Projects; Problem drivers; Alcoholism; Driver improvement measurement; Driver intoxication

AVAILABILITY: NHTSA

HS-810 230 Fld. 3/1

NHTSA PLANS FOR TESTING A NEW ALCOHOL SCREENING DEVICE

by R.B. Voas

National Hwy. Traf. Safety Administration

1972 7p

Statement presented at a news conference, Chicago, 14 Sep 1972.

New test devices have been developed to assist a patrolling policeman in ascertaining whether a driver has been drinking. Though less accurate than the quantitative tests given at the police station, these portable breath analyzers will increase the accuracy of the police in detecting drunk drivers, reduce the time required to make an arrest, protect the innocent drivers, and avoid embarrassment to the motorist. An explanation of how to use the device is given and the instrument is briefly described. On or about January 1, 1973 a series of field tests of these devices will begin at sites where the NHTSA is sponsoring Alcohol Safety Action Projects.

Search terms: Drinking drivers; Driver intoxication; Alcohol breath tests; Blood alcohol levels; Field tests

AVAILABILITY: NHTSA

HS-810 232 Fld. 3/0

APPLIED HUMAN FACTORS IN MANPOWER DEVELOPMENT: THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION MANPOWER DEVELOPMENT PROGRAM

by W.E. Tarrants

National Hwy. Traf. Safety Administration

1972 16p

Highway safety management at all levels needs high quality, well-educated and experienced personnel if it is to be responsive to the changing demands of the highway system and its users. The nation's safety manpower requirements are determined and met by identifying task requirements, identifying numbers and types of manpower required, developing policies and priorities, identifying and evaluating training resources, developing curriculum materials and other training resources, conducting instructor institutes, sponsoring training programs, and evaluating program effectiveness. A model for training program development is presented. This model is followed in all curriculum development projects conducted or sponsored by NHTSA. Highway traffic safety occupations for which curriculum materials have been prepared, or are being prepared, are described, along with the process for evaluating training program effectiveness.

Search terms: Highway safety organization management; Manpower utilization; Instructor training; Program evaluation; Training facilities; Instruction materials; Personnel management; Priorities; Highway safety programs

AVAILABILITY: NHTSA

HS-810 233 Fld. 3/1

REMARKS BEFORE THE 14TH ANNUAL CONVENTION, AUTOMOBILE WHOLESALERS OF NEW ENGLAND, CAPE COD, MASS., SEPTEMBER 23, 1972

by J.E. Wilson

National Hwy. Traf. Safety Administration

1972 18p

The author briefly mentions the organization of the NHTSA, highway death statistics, and the estimated number of lives saved by the use of seat belts. Emphasis, however, is on the problem of drinking drivers, allowable BAC's, the work of the Office of Alcohol Countermeasures, and the Alcohol Safety Action Projects. A plea is made for more public education on alcohol problems.

Search terms: National Highway Traffic Safety Administration; Drinking drivers; Blood alcohol levels; Alcohol Safety Action Projects; Alcohol usage deterrents; Alcohol education; Seat belt effectiveness; Fatality rates

AVAILABILITY: NHTSA

HS-810 235 Fld. 1/1

EMS IN THE USA–OVERVIEW

by D.A. Mills

National Hwy. Traf. Safety Administration

1972 29p 17refs

Presented at 1st International Symposium on Emergency Medical Services, Honolulu, 31 Jul-4 Aug 1972. Sponsored by American Paramedical Inst.

The need for greater emergency medical services in the U. S. is stressed. Functions of an emergency medical system include: accident detection, accident reporting, ambulance dispatching, driving the ambulance to the scene, rendering of emergency care, extricating the injured, transferring the injured, admittance to the hospital, and providing definitive medical care in the hospital. Training, communications, and evaluation of the whole system are mentioned.

Search terms: Emergency medical services; Ambulances; Ambulance personnel training; Occupant rescue; Hospitals; Emergency reporting systems; First aid; Transportation of injured; Systems analysis; Communication systems

AVAILABILITY: NHTSA

NHTSA Imprints

HS-820 213 Fld. 5/17

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS REPORTED TO THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION BY DOMESTIC AND FOREIGN VEHICLE MANUFACTURERS, APRIL 1, 1972 TO JUNE 30, 1972

National Hwy. Traf. Safety Administration

1972 38p

This tabulation of safety defect recall campaigns includes the make and model, model year, description of the defect requiring manufacturer's corrective action, number of vehicles recalled, date of notification, and identification number. Automobiles, trucks, school buses, trailers, and tractors are included. Child car seats are also included.

Search terms: Defect correction; Statistics; Automobile recall campaigns; Truck recall campaigns; Tractor recall campaigns; School bus recall campaigns; Defective vehicles; Trailer recall campaigns; Child safety seats

AVAILABILITY: GPO $.40

SPECIAL ANNOUNCEMENT

We will be pleased to announce in HSL your research paper or research report not previously announced in this journal. The material must be directly related to Highway and/or Motor Vehicle Safety and must fall within the scope of the Table of Contents – Subject Fields and Groups.

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III	Regional Administrator, NHTSA, Room 817 Federal Building, 31 Hopkins Plaza, Baltimore, Maryland 21201 Tel: 301-962-3878. (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia)
IV	Regional Administrator, NHTSA, (Suite 400) 1720 Peachtree Road, N.W., Atlanta, Georgia 30309, Tel: 404-526-5537. (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee)
V	Regional Administrator, NHTSA, Suite 214, Executive Plaza, 1010 Dixie Highway, Chicago Heights, Illinois 60411, Tel: 312-756-1950 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin)
VI	Regional Administrator, NHTSA, 819 Taylor Street, Room 11A26, Forth Worth, Texas 76102, Tel: 817-334-2021. (Arkansas, Louisiana, New Mexico, Oklahoma, and Texas)
VII	Regional Administrator, NHTSA, P.O. Box 7085, Country Club Station, Kansas City, Missouri 64113, Tel: 816-361-0860 (Ext. 7887) (Iowa, Kansas, Missouri, and Nebraska)
VIII	Regional Administrator, NHTSA, 330 South Garrison Street Lakewood, Colorado 80226, Tel: 303-234-3253 (Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming)
IX	Regional Administrator, NHTSA, 450 Golden Gate Avenue, Box 36112, San Francisco, California 94102. Tel: 415-556-6415 (Arizona, California, Hawaii, and Nevada)
X	Regional Administrator, NHTSA, 5140 Federal Office Building, Seattle, Washington 98104, Tel: 206-442-5934 (Alaska, Idaho, Oregon, and Washington)